

Claims

1. (Currently amended) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a selected wavelength; and

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer; and

following the step of applying supercritical carbon dioxide to the wafer, obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering the immersion lithography medium from the mixture.

2. (Original) A process as in claim 1 wherein the immersion lithography medium is a fluoropolymer.

3. (Original) A process as in claim 1 wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation.

4. (Original) A process as in claim 1 wherein the selected wavelength is in a range from about 11 nm to about 400 nm.

5. (Original) A process as in claim 1 wherein the selected wavelength is about 157 nm.

6. (Original) A process as in claim 1 wherein the material forming the surface of the semiconductor wafer is photosensitive to the selected wavelength.

7. (Cancelled)

8. (Currently amended) A process as in claim 7 claim 1, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

9. (Original) A process as in claim 1, wherein exposing comprises passing the radiation through the immersion lithography medium.

10. (Currently amended) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a wavelength of about 157 nm, the exposing comprising passing the radiation through the immersion lithography medium; and

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer;

following the step of applying supercritical carbon dioxide to the wafer, obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering the immersion lithography medium from the mixture; and

recycling the recovered immersion lithography medium.

11. (Original) A process as in claim 10 wherein the immersion lithography medium is a fluoropolymer.

12. (Original) A process as in claim 10 wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation.

13. (Original) A process as in claim 10 wherein the material forming the surface of the semiconductor wafer is photosensitive to the selected wavelength.

14. (Cancelled)

15. (Currently amended) A process as in claim 14 claim 10, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

16. (Original) A process for fabricating a semiconductor device, comprising:

applying an immersion lithography medium to a surface of a semiconductor wafer, wherein the immersion lithography medium is substantially non-reactive with the material forming the surface of the semiconductor wafer and is substantially transparent to the radiation;

exposing a material on the surface of the semiconductor wafer to electromagnetic radiation having a wavelength of about 157 nm, the exposing comprising passing the radiation through the immersion lithography medium;

applying supercritical carbon dioxide to the semiconductor wafer to remove the immersion lithography medium from the surface of the semiconductor wafer; and

obtaining a mixture of the immersion lithography medium removed from the surface and carbon dioxide and recovering the immersion lithography medium from the mixture.

17. (Original) A process as in claim 16 wherein the immersion lithography medium is a fluoropolymer.

18. (Original) A process as in claim 16 wherein the material forming the surface of the semiconductor wafer is photosensitive to the radiation.

19. (Original) A process as in claim 16, wherein recovering includes reducing pressure and/or temperature of the mixture and removing carbon dioxide from the mixture.

20. (Original) A process as in claim 16, wherein the immersion lithography medium recovered from the mixture exhibits substantially the same chemical composition and/or substantially the same purity as the immersion lithography medium applied to a surface of the semiconductor wafer.

21. (New) A process as in claim 1, wherein the immersion lithography medium recovered from the mixture exhibits substantially the same chemical composition and/or substantially the same purity as the immersion lithography medium applied to a surface of the semiconductor wafer.

22. (New) A process as in claim 1, wherein the immersion lithography medium recovered from the mixture is purified after the recovering.